

Famous New Yorker Gertrude Belle Elion

Gertrude Belle Elion received the Nobel Prize in Medicine without ever becoming a doctor. She didn't need a doctorate to make some of the 20th century's most important contributions to medicine.

The daughter of a dentist, Gertrude Belle Elion was born in New York City on January 23, 1918. Shortly before she enrolled at Hunter College, her grandfather died of cancer. The loss inspired her to find a cure for cancer by learning organic chemistry.

Elion received her bachelor's degree in 1937. At the time there were few job opportunities for women in her chosen field. She worked as a schoolteacher and part-time lab assistant before earning a master's degree from New York University in 1941.

Like women in many professions, Elion saw job opportunities open up as men enlisted to fight in World War II. Wellcome Research Laboratories, a pharmaceutical company, hired her in 1944 as a biochemist assisting Dr. George H.

Hitchings. Like Elion, Hitchings dedicated himself to medical research after the death of a close relative. Educated in a racially-integrated high school, he welcomed women as colleagues.

Elion found intellectual fulfillment working with Hitchings, but felt that the lack of a Ph.D. still handicapped her. She resumed graduate studies at Brooklyn Polytechnic Institute while working at Wellcome, but the school eventually refused to let her study part-time. Forced to choose between her doctorate and her job, she stayed at Wellcome.

Hitchings's research team sought to fight cancer and other diseases at the cellular level. Elion and Hitchings made a crucial observation: if cancer cells develop differently from normal cells, through different chemical processes, you could figure out how to block their growth without interfering with the growth of normal cells. The next challenge was finding a substance that would have the desired effect. Scientists could test millions of natural substances for that effect, but why not create something to do exactly what you want?

Before DNA was officially discovered, Elion studied its building blocks to learn how cancer cells grew. Her pioneer work in rational drug design led to the creation of a synthetic antimetabolite – a compound that blocked the growth of leukemia cells. Her drug, called 6-mercaptopurine, put leukemia patients into temporary remission. Elion continued her research, looking for a permanent cure. Using 6-mercaptopurine with other drugs for childhood leukemia had the best long-term results.

Some of the antimetabolites developed by Elion and Hitchings had the side effect of weakening the immune system. That made patients more vulnerable to other diseases, but Elion realized that the same drugs could save lives if used to prevent the immune system from rejecting transplanted organs.

Rational drug design led to treatments for a growing number of specific diseases, from malaria to meningitis. Elion's methods made possible the development of drugs to combat herpes and the HIV virus. As later researchers built on her work, Elion was promoted to head Glaxo Wellcome's department of experimental therapy.

The Nobel Prize Elion shared with Hitchings in 1988 for "discovering important principles for drug treatment" was one of many honors she received. Brooklyn Polytechnic, now known as Polytechnic Institute of New York, awarded her an honorary doctorate, as did Harvard. She remained active as a researcher and mentor to scientists until her death on February 21, 1999. No one questions her credentials as a trailblazer whose work improved countless lives.



Image courtesy of Wellcome
Library, London



New York City is home to over 8 million people making it the most densely populated city in the United States.

For more information about Gertrude Elion and the Nobel Prize for Medicine go to http://www.nobelprize.org/nobel_prizes/medicine/laureates/1988/elion-bio.html and www.nobelprize.org. This is one of a series of Famous New Yorker profiles written by Kevin Gilbert for the NYNPA-Newspaper In Education. All rights reserved 2014.